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### Creating value that can't be copied

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**CREATING VALUE THAT CAN'T BE COPIED.  
THE USE OF CONJOINT ANALYSIS TO ASSESS CUSTOMER VALUE  
IN NEW SERVICE CREATION**

*J.W. van der Haar, R.G.M. Kemp and S.W.F. Omta*

**SOM-theme A Primary processes**

**Abstract**

One of the greatest challenges for the industrial marketing manager is to incorporate the 'voice of the customer' into the design of new products and services. In this paper we suggest a three-step approach to fine tune the product and service offerings of the company. We illustrate how to use a conjoint analysis to bridge the information gap between the company and its customers, by confronting the value the company intends to offer with the value desired by its customers. The illustration is based on a case study in business-to-business marketing, conducted at a technology-based multinational company in office equipment. Different service offerings were presented to customers and prospects as in a real-life purchasing situation. Based on the results, different types of newly designed services that increase the value for the customer could be developed.

Keywords: customer value, business-to-business marketing, conjoint analysis

## **Introduction**

In recent years, customer value has become the strategic focus point for technology-based companies. Driven by the realization that it is the total solution that offers value to the customer, technology-based companies are increasingly selling 'customer value' instead of products. Therefore, it is critical for these technology-based companies to gain an accurate understanding of the potential value of their offerings, and to learn how this value can be further enhanced [e.g. 23, 29, 30]. Consequently, the clear assessment of the value a product or service might offer to the customer has become a topic of growing interest in the field of industrial marketing. An important tool to elicit customer value at an early stage of development is the conjoint analysis [2, 17, 20, 29]. The present paper illustrates how conjoint analysis can be used to close the information gap between the company and its customers, by confronting the value the company intends to offer to its customers with the value desired by them. The illustration is based on a case study of a new service introduction, conducted at a technology-based multinational company in office equipment.

The paper is organised as follows. In the theoretical framework, we will first discuss the theoretical background of the study. We will start with the definition of customer value and the problems imposed on industrial marketing research to assess it properly. Second, we will discuss the customer value model developed in this study, in more detail. Third, we will discuss the methodological background of the conjoint analysis. Then the case study will be described as an illustration of the use of conjoint analysis to assess the customer value of new service creation in business-to-business marketing.

## **THEORETICAL FRAMEWORK**

### **The customer value concept**

Basically, the customer value concept assesses the value a product offers to a customer, taking all its tangible and intangible features into account. Although this concept is somewhat ambiguous in nature, most authors agree that it pertains to a trade-off between the benefits the product offers to the customer, and the sacrifices a customer has to make to obtain it [e.g. 11, 12, 17]. Specifically, customer

sacrifices are the overall monetary and non-monetary costs, for example time, energy and effort, the customer invests in order to get the product or service, or to maintain the relationship with the company. The outcome of weighing up the pros and cons may differ considerably among customers because of the differences in their individual situation. For instance, a car manufacturer may deliver a sensor system for parking assistance, a feature that might be embraced by people who live in crowded cities, while people who live in the country might not perceive this as added value because they have enough parking space. Consistent with this are the findings of Levitt [18] that different product characteristics have different influences on the customer's perception of the product. Therefore, Woodruff and Gardial [29] have included the customer's perception in their definition of customer value:

*'The customer's perception of what they want to happen in a specific use situation, with the help of a product and service offering, in order to accomplish a desired purpose or goal'.*

Customer value is typically a dynamic concept, for the perceived value of a product or service may change over time. The drivers that motivate a customer's initial purchase may differ from the criteria that connote value during use right after purchase, which in turn may differ from the determinants of value during long term use [8, 10, 30]. For instance, as the experience with the product increases, the need for service and consulting may decrease.

A number of authors have linked achieving higher customer value to higher profitability for the company [6, 8, 25, 27]. However, it should be noted that just bringing a product to the market with a high potential customer value is no guarantee for a high market share or profits per se, because the customer's purchase decision is based on a choice between the competing offers in the market place. The attractiveness of an individual product offer should always be measured relative to competing products. But, as Armstrong and Collopy [4] argue, this does not mean that competitors should be the main focus of the corporate strategy. Their data show that, generally speaking, companies with a pure competitor-oriented strategy are less profitable and less likely to survive than customer-oriented companies. A related problem is reported by Pine et al. [24], who warn that companies struggling for market share may end up providing their customers with

more choices than they want or need. To illustrate this, they report that only 20% of Toyota's product varieties account for 80% of its sales.

In the current hyper-competitive environments, where sources of product- and process-based competitive advantage are quickly imitated by competitors, it is becoming increasingly difficult to differentiate on technical features and quality alone. For instance, Hewlett-Packard states that for most of its new products the window of technical superiority is less than six months [21]. Companies may overcome this problem by offering total solutions to customer needs. This is one of the reasons why technology-based companies increasingly add services to their capital goods. The intangible character of services makes them harder to copy because their quality largely depends on the firm's personnel and culture. This is the core of the 'customer value concept', which advocates thinking in terms of the "total" value proposition (e.g. product, services, channels, ideas) instead of the tangible features alone [10, 19, 26].

Although the conceptual importance of customer value is increasingly recognised in the marketing literature, its application in real-life industrial market studies lags behind, merely because the operationalisation of the concept still poses difficulties to the market researcher. One of the problems is that customer value can be defined at different abstraction levels [5, 14, 16, 19, 21], and consequently, has to be measured at these different levels [10, 23, 29]. Basically, two abstraction levels of customer value can be distinguished. The first-order level consists of the trade-off between the perceived benefits and the sacrifices of a product as perceived by the customers at the purchasing decision. The second-order level consists of the benefits customers seek to fulfil their goals (e.g. comfortable and reliable transportation [10]). This is the level at which customers think about their needs before the purchase. The problem is that especially for new products and services, these goals and desires at second order level are often vague and therefore difficult to assess for the market researcher. Therefore, a number of companies rely on easier to measure- customer satisfaction data as a basis for business development. Nevertheless, these firms often fail to recognise the lack of strategic content of these measurements [26, 30]. Whereas customer satisfaction data can only be used for improving existing products, customer value data generate the necessary information to create a differentiated product offering for targeted customers [11]. One could say that customer value drives customer satisfaction by delivering the value that satisfies customers. In the case study, a

conjoint analysis is used for the up-front assessment of the second-order goals and desires of targeted customers based on the conceptual model of customer value discussed in the next paragraph.

## The conceptual model of customer value

The customer value model<sup>1</sup>, presented in figure 1, shows the business development process from vague idea to market offer both from the company's and the customer's perspective.

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**Figure 1 about here**

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At the start of the business development process, the company may have only vague ideas about the value it intends to offer to its customers. This value depends on the company's perceptions of what the customer wants, and is based on its strategy, capabilities and resources [8]. In the model, we call this the *intended value map* of the company. Through market research, the company will try to match its intended value map with the preferences and desires of the future users to create a product that fulfils the customer needs. In the customer value model, we cluster these vague ideas at the second-order abstraction level as the *desired value map* of the customer. The term value map is used here, since the customer value of a product or service can best be described as a bundle of values, being the aggregation of its benefits and sacrifices. A gap may occur between these two maps. This *information gap* reflects a situation in which the company has insufficient information about what the customer desires. Due to restraints in the company's strategy and/or marketing capabilities, the company may focus on the 'wrong' customer needs.

After the business development process, a product is created and introduced to the marketplace. The value of the product as designed by the company is called the *designed value map* in the model. The designed value may differ from the intended

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<sup>1</sup> The customer value model is based on the SERVQUAL (Service Quality) model developed by Zeithaml et al. [31] to assess the customer satisfaction of service offerings. The two basic features of this model are the definition of service quality in terms of a comparison between the expected and the perceived benefits for the customer, and the identification of the gaps between these two in the delivery process.

value because of technical restraints and/or miscommunication between marketing and product development. This will result in the *design gap*. When the product is ‘on-the-shelf’, it represents some kind of first-order value to the customer. Customers base their expectations of the product’s performance on what they perceive. This expectation is called the *expected value map* in the model. This map may differ from the desired value map because there might not be any product on the market that exactly match the customers’ desires. Therefore, customers have to choose that product or service that best matches their expectations. In other words, they have to make a compromise between the value they perceive in the marketplace and the value they would desire. The smaller this *compromise gap*, the higher the chance that the company is successful in winning customers. The *perception gap* reflects the potential mismatch between the value designed by the company, and the customers’ perception of this value. How potentially advantageous a product offer might be for customers, if they do not recognize this at the purchasing decision, it is of no use to the company. A company can try to reduce this gap by making certain intangibles more tangible via corporate communication.

After the purchase and usage, customers will evaluate the value they have received. The outcome of this evaluation is called the *received value map* in our model. The *satisfaction gap* reflects the gap between the expected and the received value, as extensively described by Zeithaml et al. [31]<sup>2</sup>.

### **Conjoint analysis**

For nearly 30 years, conjoint analysis has been used to quantify customer information. In this study, conjoint analysis is specifically used to allow companies to make design trade-off decisions by estimating the value that customers associate with particular features and attributes of a product or service<sup>3</sup>. These attributes and

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<sup>2</sup> In the SERVQUAL model, the received value is called the perceived value. This term is not used here, because it is somewhat misleading, for all the value maps are based on perceptions.

<sup>3</sup> Whereas features can take on any value along a continuum (e.g. price or weight), attributes can take on one of a discrete set of levels (e.g. 2 or 4WD [20]).



features can be subdivided in levels, for example, the attribute ‘copier speed’ may include the attribute levels 6 ppm, 12 ppm, and so forth. While traditional (so called compositional) analyses evaluate the different attributes and features separately, conjoint analysis presents the complete product concept to the customer for evaluation [7]. By doing so, it evaluates the multiple (often interrelated) attributes and attribute levels ‘jointly’ (hence the term conjoint analysis) to identify the product profile that contains the most preferred combination of attributes. The preferences are then deconstructed into judgements at the individual attribute levels. The main advantage of compositional analysis is, of course, the relatively simple method of data collection and the limited cognitive demand required of the respondents. However, conjoint analysis better represents real life conditions, and thus provides a more realistic picture of what customers will buy in the real purchase situation [7, 13, 22].

## **THE CASE STUDY**

The goal of the case study was to assess the desired value map of the customers for a new service offer from a technology-based multinational company in the market of medium-volume color printing and copying.

### **Description of the company**

The company is active in over 80 countries and employs some 20,000 staff members. There are branches in 31 countries, with a sales volume of over US\$ 3 billion worldwide. The greater part of the research, production and international marketing activities are concentrated at the head office in the Netherlands.

### **Study design**

Following the framework of Hair et al. [13], the study design consisted of three phases.

#### ***Phase 1***

In the first phase, the current product offer was divided into six value areas: functionality, productivity, financial risk, marketing, organization, and digital features. This was done through an iterative process blending input from engineering, marketing and industry experts from the company in question. Each value area represented a number of values desired by the customer.

In twenty-one semi-structured face-to-face interviews with customers and prospects (see table 1)<sup>4</sup>, these value areas were discussed in-depth. The interviews were structured following ‘the Grand Tour’, a technique often used in customer value interviews [29]. The interviews took about 1 hour each. The respondents were selected to represent a crosssection of the entire market. In the interviews, respondents stated current problem areas and needs as well as future desires. This data was used to get an idea about the customers’ desired value map and for the analysis of areas where extra services could be provided. This is because to conduct business development properly, it is important to collect information about the more abstract value levels, that is the customer needs.

The drivers for customer value (product- and service attributes) were determined per value area. The value area ‘functionality’ referred to special features of the product, as well as to possible training and support offerings by the company in using these features. In the value area ‘productivity’, all value added features and activities were included that increased the product’s performance and uptime. The value area ‘financial risk’ referred to the value that reduced the perceived risk of the customers of earning back their investment. Added value in marketing is created by helping the (industrial) customer to increase his turnover. Organizational value is hard to define, but should not be neglected [4]. Many customers see the organization’s positive image as an important driver for their purchasing decision. Finally, the value area ‘digital features’ referred to specific features and services which improved the digital value of the product. For example, when using a computer for printing documents on a copier, training and support are needed in handling these digital documents. The respondents stated that only three areas were perceived as especially important in their purchasing decision, namely the value areas of digital features, productivity and marketing assistance. These

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<sup>4</sup> A prospect is a potential ‘target’ customer who currently uses a competing product and has shown interest in the company’s product.

were the value areas, together with price, which were evaluated in the conjoint analysis.

## ***Phase 2***

In the second phase of the study, the data from the interviews was analyzed qualitatively. Based on the results of the interviews and competitor offerings, possible solutions, features and attributes were formulated for each value area. Together with corporate managers (by means of focus groups), the solutions stated were clustered into two types of supportive services (active and re-active values [14]). Both active and re-active values focus on solutions for certain needs. Active value manipulates an object to produce value, whereas reactive value delivers value in itself. The company's support in the value area of digital features can be of an active nature, if customers are taught how to use the digital features, or re-active, if the company sends out consultants who help the customers when problems occur. The same holds for the value area of productivity, whereby the company can either educate its customers up front, or can react to service calls to send in mechanics. In the value area of marketing, the company can either offer market information and courses to its clients, or can offer ready-made promotional material.

The corporate managers evaluated whether these offerings could be delivered at a realistic price. Although the desired value map of the customers should always be the starting point, if treated uncritically, it may result in a product offer that is impossible for the company to deliver. Based on the discussions with corporate managers, we used three price levels in the conjoint profiles, \$1,000, \$1,250, and \$1,500. By using the aforementioned procedure, we were able to create realistic and communicable service offerings. Figure 2 shows one of the profiles used in the conjoint analysis.

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**Figure 2 about here**  
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## ***Phase 3***

As the third part of our study, a 5-page mail survey questionnaire was presented to customers and prospects in the market of medium-volume color printing. In the convenience sample, we selected three different user segments, Office, Shop, and

Art. The 5-page survey questionnaire consisted of three separate parts. The current service offerings were briefly assessed, using 11 pre-coded questions based on 7-point Likert-type scales. In addition, the respondents were asked to rank 9 conjoint profiles from most to least preferred, and to select the top 6 out of a list of 20 additional service offerings that were formulated more concretely than the more abstract solutions in the conjoint analysis. To assure uniform interpretation, a preliminary version of the questionnaire was pilot-tested with the experts in the focus groups, and background information about the different service profiles was provided in the survey questionnaire.

### **Data analysis**

The data was analyzed using the statistical software program SPSS. To analyze the satisfaction scores between customers and prospects, non-parametric Kruskal Wallis tests were used. For the conjoint analysis, a fractional factorial design was used based upon the seven basic plans of Addelman [1]. Based on the previous interviews with customers, we chose for an additional model. The attributes we used did not suggest interaction effects. The conjoint analysis was validated by calculating Kendall's Tau, which describes the correlation between the observed and the expected utility scores.

No significant differences were found between customers and prospects. However, clear differences could be demonstrated between the three user segments concerning the use of the product, the level of experience in the use of digital equipment, and the quality demand of the customers. Therefore, the results of the conjoint analysis were analyzed separately for the three segments.

### **Data collection**

The data for this study was collected in 1998. Table 1 shows the number of interviewees and the number of respondents to the mail survey questionnaire, overall, and for the three segments, separately. The semi-structured interviews were held with 13 customers and 8 prospects. The mail survey questionnaire was sent to 102 customers and prospects in Belgium, Germany and the Netherlands. None of them was included in the semi-structured interviews; 38 returned their questionnaire, which gave a response rate of 37%.

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**Table 1 about here**  
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## Results

The semi-structured interviews revealed that the respondents were satisfied with the politeness, courtesy and competence of the service personnel. They were relatively less satisfied with the response time of the service and the quality of the support and training.

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### Table 2 about here

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Table 2 shows that the results of the semi-structured interviews were largely confirmed by the satisfaction assessment of the current service offerings in the mail survey. Interestingly, the customers of the company were significantly more critical about the company's service than the prospects. Taking into account that their own customers might have responded more critically in order to 'sharp-shod' the company, this might indicate that the company still has a way to go to by-pass competitors in service provision.

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### Table 3 about here

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Table 3 shows the results of the conjoint analysis. For the whole study sample and for the separate segments, high and significant validity scores were found (Kendall's Tau above 0.78), which provided confidence in the reliability of the utility scores. The relative importance of the different value areas is shown between brackets; a figure derived from the utility scores of the services. The underlying thought was that respondents would make the most distinct choices for the service they perceived as the most important. The (most) positive utility score indicates the most preferred solution for that value area. The most preferred product augmentation per segment is that combination of services that results in the highest utility score. Since customers ranked the full profile cards according to their preferences, this best represented their desired value map. This map turned out to be largely the same for all three segments. The value area of digital features had the highest utility scores meaning that customers made the most distinct choices for this value area and thus perceived this as most important. Training support was the service preferred for this value area. Training aimed at improving productivity was the second additional service preferred except in the segment

shops, where it was ranked third. The customers and prospects in this segment were very price sensitive. This can be explained by the fact that the shop market is highly competitive and quality is less important for the end-users in this segment. Price was ranked second and the package had to be delivered for the lowest presented price of US\$ 1,000. In the segments office and art, price was ranked third. Interestingly, customers and prospects in these segments indicated that they were willing to pay a premium price of \$1,250 for the service offered. Probably, this has to do with the quality signaling effect of price. On the other hand, in business-to-business markets, prices are not the most important selection criterion. The customers and prospects might be willing to pay more for extra value [3]. The lowest rank was given to marketing support in all three segments. The attribute preferred here was marketing information rather than promotional material.

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**Table 4 about here**  
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Table 4 shows the results of the choice of 6 out of a list of 20 concrete additional services. In total, 214 items were selected, which indicates that every respondent chose 5 to 6 items of additional services. On an overall level, the results presented in table 4 largely confirm the results of the conjoint analysis, training in digital and productivity areas being the items which were most often chosen. However, it is interesting to notice that in the value area of digital features, getting technical support was chosen by a large minority of 23% of the respondents, a fact that would have been overlooked if only the results of the conjoint analysis had been used, because of the ‘winner-takes-all’ approach of this analysis. Items regarding information in the value area of marketing were chosen much less often, namely by 14% of the respondents.

The following additional services were chosen by a high percentage of the respondents (data not shown in table 4). In the value area of digital features, 19% of the respondents expressed a need for advanced training in raster imaging, digital delivery of documents and digital document preparation. In the value area of productivity, 24% of the respondents asked for special training in preventive maintenance and problem solving. A service response time of less than 2 hours and being on stand-by in the weekends were mentioned by 15% of the respondents.

This information can be used by the company to move from the higher order value perspective used in the conjoint analysis to the lower order value

perspective of the actual trade-off between perceived benefits and sacrifices (the level of the designed value map and the expected value map). The several service attributes can now be combined into realistic service offerings, thereby forming possible designed value maps. With this information, the company can now create and communicate the combination of additional services per user segment that is most likely to win in the marketplace.

## **Discussion and conclusions**

The present study provides insight into how companies can monitor customer value in a business-to-business environment . By assessing the desired value map of their customers, via the conjoint analysis, a company can acquire a benchmark for its intended value. This way a company can guide and improve its business development activities before market introduction, using the analysis to optimize the designed value of its products and services, and to focus its corporate communication on those value areas which are perceived as most important by its customers.

The customer value model developed in this study describes how customers choose between products to try to achieve their higher order goals [10], and how a company should base its value strategy on this. In the conjoint analysis, the service descriptions were kept at the abstraction level at which customers stated their desires, so customers would not be restrained by a too narrow definition of the possible future services. This was combined with a question to select the most attractive services out of a larger list to come to a concrete service offering.

Although the conjoint analysis is often mentioned in marketing literature, it is not so often used in industrial marketing practice, probably due to its perceived complexity [23]. The present study shows that this fear is largely unfounded. If conducted by the three-step approach presented below, the number of profiles to be examined, and thereby, the cognitive load of the respondents, can be kept down. An additional advantage is that a conjoint analysis can be conducted on small samples, which is particular useful in business-to-business settings that are characterized by a relatively small sample size.

It should be noted that the results presented in this paper are far from conclusive, since they are based on one case study only. They are meant as an illustration of how to use conjoint analysis to elicit future customer preferences in



business-to-business markets. Further research is needed to validate the customer value model and the use of conjoint analysis in other business contexts. Keeping this in mind, the results presented in this paper lead to the following management implications.

### **Management implications**

One of the greatest challenges for the industrial marketing manager is to incorporate the 'voice of the customer' into the design of new products and services. In this paper, we suggest using conjoint analysis as a three-step approach to assessing the customer value up front in the business development process.

- First, we suggest starting with an assessment of customer satisfaction with the current product and service offerings, as a basis for a discussion about the customers' possible needs and wishes.
- Second, the results should be discussed interdisciplinarily by marketing managers, sales force and technical engineers, to integrate the value perceptions of the customers with the engineering capabilities of the company. This way product attribute trade-offs can be developed that are likely to be desired by the customers, and which are at the same time realistic for the company to deliver.
- Finally, the resulting conjoint profiles, combined with a selection of the products and services preferred, should be evaluated by (potential) customers as input and benchmark for the business development process.

In our view, this three-step approach provides a sound basis for conducting a value strategy, being a new way of looking at business, monitoring changes in customers perceptions, and adapting the customer value offered to these changes.

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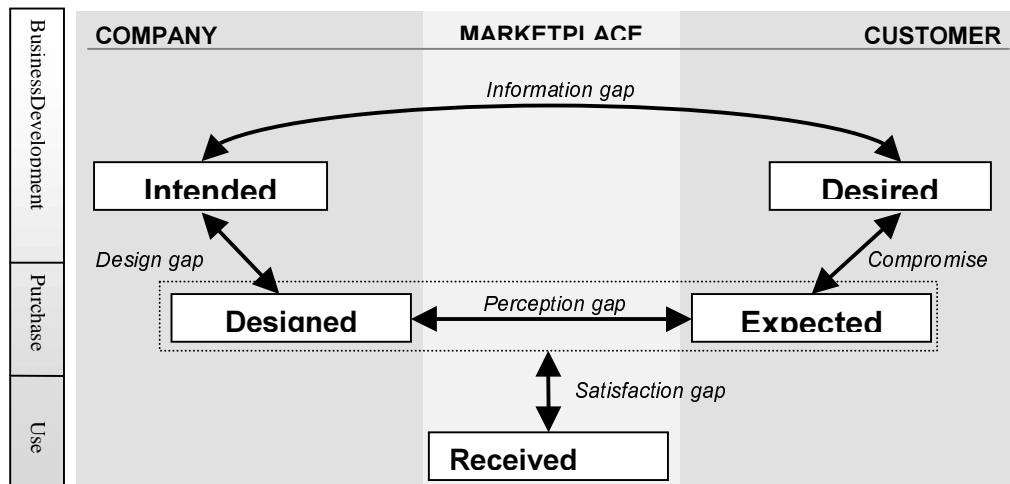


Figure 1. The Customer value model

<b>Profile A</b>	
<i>Value Area</i>	<i>Additional Service</i>
 <b>DIGITAL</b>	<b>1. Active Type of Support</b> (e.g. training)
 <b>PRODUCTIVITY</b>	<b>2. Reactive Type of Support</b> (e.g. consulting)
 <b>MARKETING</b>	<b>1. Active Type of Support</b> (e.g. information material)
<b>PRICE</b>	<b>US\$ 1,000</b>

Figure 2. Example of a conjoint profile

	<b><i>Office</i></b>	<b><i>Shop</i></b>	<b><i>Art</i></b>	<b><i>Total</i></b>
<b><i>Interviews</i></b>				
Customers	3	6	4	<b><i>13</i></b>
Prospects	1	4	3	<b><i>8</i></b>
<b><i>Mail survey</i></b>				
Customers	7	11	5	<b><i>23</i></b>
Prospects	3	8	4	<b><i>15</i></b>
<b><i>Total</i></b>	<b><i>14</i></b>	<b><i>29</i></b>	<b><i>16</i></b>	<b><i>59</i></b>

**Table 1. Number of interviewees and respondents to the mail survey, both customers and prospects**



	Customers	Prospects
<b>Customer focus</b>		
Sales, service and help desk	6.1 (0.9)	6.0 (0.6)
<b>Service quality</b>		
Service, training and manual	5.4 (1.1)	6.0 (0.8)
<b>Response time</b>		
Service and help desk	5.0 (1.3)	5.3 (0.7)
<b>Digital features</b>		
Training and technical support	4.7 (1.4)	5.3 (1.0)

**Table 2. Assessment of customers and prospects of the current service offerings (Likert type 7-point scale, mean and (std))**

	<b>Digital features</b>		<b>Productivity</b>		<b>Marketing</b>		<b>Price</b>	
<b>Office</b> (Kendall's tau = 0.89)	Education	1.25	Education	0.35	Information	0.40	US\$ 1,000	0.30
	Consulting	-1.25	Service call	-0.35	Promotion	-0.40	US\$ 1,250	0.43
							US\$ 1,500	-0.73
	(39%)		(21%)		(20%)		(20%)	
<b>Shop</b> (Kendall's tau = 0.78)	Education	1.32	Education	0.30	Information	0.21	US\$ 1,000	0.32
	Consulting	-1.32	Service call	-0.30	Promotion	-0.21	US\$ 1,250	0.09
							US\$ 1,500	-0.40
	(37%)		(24%)		(12%)		(27%)	
<b>Art</b> (Kendall's tau = 0.87)	Education	1.53	Education	0.11	Information	0.19	US\$ 1000	-0.04
	Consulting	-1.53	Service call	-0.11	Promotion	-0.19	US\$ 1,250	0.25
							US\$ 1,500	-0.22
	(35%)		(31%)		(14%)		(20%)	
<b>Total</b> (Kendall's tau = 0.94)	Education	1.35	Education	0.27	Information	0.26	US\$ 1,000	0.23
	Consulting	-1.35	Service call	-0.27	Promotion	-0.26	US\$ 1,250	0.22
							US\$ 1,500	-0.45
	(37%)		(25%)		(15%)		(23%)	

**Table 3. Utility scores per segment, the relative importance of the different value areas is between brackets**

	<b>Digital features %</b>	<b>Productivity %</b>	<b>Marketing %</b>	<b>Total %</b>
<b>Training</b>	29	30		59
<b>Technical support</b>	23	2		25
<b>Marketing info.</b>			14	14
<b>Promotion</b>			2	2
<b>Total</b>	52	32	16	100

**Table 4. Most desired attribute levels per value area**